I'll briefly discuss the development and application of generalized linear mixed models to the genetic analysis of livestock performance traits. As current livestock genetic evaluation systems are predominantly based on all identifiable pedigree information, the inferential and computing challenges in highly parameterized generalized linear mixed models are not trivial. Development and adoption of new methods for drawing appropriate inferences on genetic parameters have been particularly essential. We've considered hierarchical extensions that allow for complex dispersion patterns that accommodate heteroskedasticity and outlier robustness. Steady advances in available computing power are facilitating multiple-trait analyses for joint inference on continuous (e.g. production) and discrete (e.g. fertility) measures. In tandem with these advances, fully Bayesian inference via the continually refined development of Monte Carlo Markov Chain methods will continue to allow even greater generality and dimensions in livestock genetic evaluation models.